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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/709,115	04/14/2004	Douglas D. Coolbaugh	BUR920030087US1	3114
30449	7590	10/04/2005	EXAMINER	
SCHMEISER, OLSEN + WATTS			HU, SHOUXIANG	
3 LEAR JET LANE			ART UNIT	
SUITE 201			PAPER NUMBER	
LATHAM, NY 12110			2811	

DATE MAILED: 10/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

✓ * E/C

Office Action Summary	Application No.		Applicant(s)	
	10/709,115		COOLBAUGH ET AL.	
	Examiner		Art Unit	
	Shouxiang Hu		2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 4-7 and 9-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>4/14/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Claims 4-6 and 9-20 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 20050729.

Applicant's above election with traverse is acknowledged. The traversal is on the ground(s) that search and examination of all claims would place no undue burden on the examiner. This is not found persuasive because: although only a few of classes/subclasses were given in the previous office action, they are only the exemplary ones. Along with required key word search, a thorough search is required in a variety of different groups of classes/subclasses for Group-I invention and Group-II invention, respectively. And, thousands of relevant references need to be searched and considered for each of the substantially distinctive species. Thus, search and examination of all of the inventions and species would impose a substantially undue burden upon the examiner.

In addition, it is reassured that, upon the allowance of any of the independent claim(s), applicant will be entitled to consideration of claims to additional group and/or species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the

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election, applicant must indicate which are readable upon the elected species. MPEP 809.02(a).

Accordingly, the election requirement is still deemed proper.

Furthermore, claim 7 is also withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being unreadable on the elected species I of Fig. 1. The subject matter recited in claim 7 about the full expansion of the void appears to be readable only on the non-elected species 3 of Fig. 3.

Accordingly, claims 1-20 are pending in this application; and claims 1-3 and 8 remain active in this office action.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 3 and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Li (Li et al., US 6,911,360).

Li discloses a resistor structure (Fig. 3), comprising: an electrically conductive region (64; silicide); a liner region (66; it is readable as a liner region as it is covers a bottom surface of the layer 64 or a top surface of the layer 68); first and second contact

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regions (28 and 38), wherein in response to a current flowing in the electrically conductive region, a void region in therein expands due to electromigration so as to increase the resistance of the resistor structure (see col. 2, lines 1-20).

Regarding claim 3, the void expands naturally along the recited direction as it is inherent in electromigration.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Li in view of Lee (Lee et al., US 5,917,244) and/or Kobayashi (US 5,083,183).

The disclosure of Li is discussed as applied to claims 1, 3 and 8 above.

Li does not expressly disclose that the electrically conductive region can be surrounded by the liner region and that they can both in direct contact with the second contact region. However, as evidenced in Lee (Figs. 5-7; also see col. 3, lines 23-30, and col. 12, lines 8-29), one of ordinary skill in the art would readily recognize that such a surrounding liner (18a and 22a) is desirable for forming an electrically conductive wire (20a) so as to protect the nearby circuits against any adverse interdiffusion of the wire associated with electromigration; and one of ordinary skill in the art would also readily recognize that, as evidenced in Kobayashi (Fig. 4), such direct contact between both of

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the wire (13) and its liner (14) and the second contact region (17) for reducing contact resistance.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the surrounding liner of Lee into the resistor structure of Li with direct contact being formed between both of the wire and its surrounding liner and the second contact region, per the teachings of Kobayashi, so that a resistor structure with reduced interdiffusion and/or reduced contact resistance would be obtained.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shouxiang Hu whose telephone number is 571-272-1654. The examiner can normally be reached on Monday through Thursday, 7:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SH
September 28, 2005



SHOUXIANG HU
PRIMARY EXAMINER